



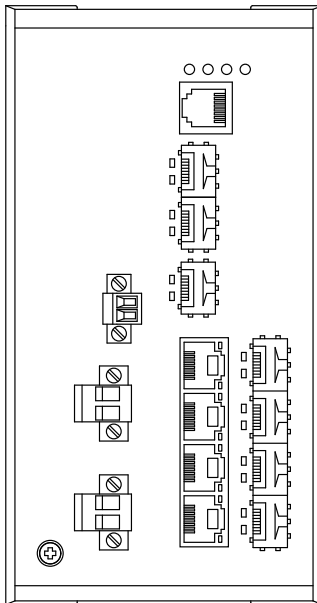
HIRSCHMANN

A **BELDEN** BRAND

User Manual

Installation

Industrial Ethernet Rail Switch Power RSP20/25/30/35



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About this manual

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.

Documentation mentioned in the “Installation” user manual that is not supplied with your device as a printout can be found at:

doc.hirschmann.com

Important information

Read these instructions carefully, and familiarize yourself with the device before trying to install, operate, or maintain it. The following notes may appear throughout this documentation or on the device. These notes warn of potential hazards or call attention to information that clarifies or simplifies a procedure.

Warning symbols



This is a general warning symbol. This symbol alerts you to potential personal injury hazards. Observe all safety notes that follow this symbol to avoid possible injury or death.

La présence de ce symbole sur une étiquette « Danger » ou « Avertissement » signale un risque d'électrocution qui provoquera des blessures physiques en cas de non-respect des consignes de sécurité.



If this symbol is displayed in addition to a safety instruction of the type "Danger" or "Warning", it means that there is a danger of electric shock and failure to observe the instructions will inevitably result in injury.

La présence de ce symbole sur une étiquette « Danger » ou « Avertissement » signale un risque d'électrocution qui provoquera des blessures physiques en cas de non-respect des consignes de sécurité.



This symbol indicates the danger of hot surfaces on the device. In connection with safety instructions, non-observance of the instructions will inevitably result in injuries.

Ce symbole indique le risque de surfaces chaudes sur l'équipement. En relation avec les consignes de sécurité, le non-respect des instructions entraînera inévitablement des blessures.

DANGER



DANGER indicates a hazardous situation which, if not avoided, will result in death, serious injury, or equipment damage.

DANGER



DANGER indique une situation dangereuse qui, si elle n'est pas évitée, entraînera la mort, des blessures graves ou des dommages matériels.

WARNING



WARNING indicates a hazardous situation which, if not avoided, could result in death, serious injury, or equipment damage.

AVERTISSEMENT



AVERTISSEMENT indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner la mort, des blessures graves ou des dommages matériels.

CAUTION



CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury, or equipment damage.

ATTENTION



ATTENTION indique une situation dangereuse qui, si elle n'est pas évitée, peut entraîner des blessures légères ou des blessures modérées ou des dommages matériels.

NOTICE

NOTICE is used to address practices not related to physical injury which could result in equipment damage.

AVIS

AVIS est utilisé pour indiquer des pratiques non liées à des blessures corporelles qui peuvent entraîner des dommages matériels.

Contents

- About this manual.....3
- Important information.....4
- Warning symbols.....5
- 1. Safety instructions..... 12**
 - 1.1. Qualification requirements for personnel.....13
 - 1.2. Intended use.....14
 - 1.3. Installation site requirements.....14
 - 1.4. Device casing.....15
 - 1.5. Strain relief.....16
 - 1.6. Electrical connections.....16
 - 1.6.1. Grounding the device.....16
 - 1.6.2. Shielding ground.....17
 - 1.6.3. Requirements for connecting electrical wires.....17
 - 1.6.4. Requirements for connecting the supply voltage.....17
 - 1.6.5. Specific requirements for connecting the supply voltage.....18
 - 1.6.6. Requirements for connecting the signal contact.....21
 - 1.7. Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2).....22
 - 1.8. ATEX directive 2014/34/EU – specific regulations for safe operation.....25
 - 1.9. IECEx – Certification Scheme for Explosive Atmospheres.....26
 - 1.10. LED or laser components.....27
 - 1.11. Recycling note.....28
- 2. Approvals..... 29**
 - 2.1. CE marking.....29
 - 2.2. FCC note.....30
- 3. Description..... 32**
 - 3.1. Device name and product code.....34
 - 3.2. Device views.....37

3.2.1. Front view.....	37
3.2.2. Rear view.....	38
3.3. Power supply.....	39
3.3.1. Supply voltage range 12 V DC ... 24 V DC.....	39
3.3.2. Supply voltage range 24 V DC ... 48 V DC.....	39
3.3.3. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC (1 voltage input).....	39
3.3.4. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC (2 voltage inputs).....	40
3.4. Management Interfaces.....	40
3.4.1. V.24 interface (external management).....	40
3.4.2. SD card interface	41
3.5. Ethernet ports.....	41
3.5.1. Twisted-pair port 10/100 Mbit/s.....	41
3.5.2. F/O port 100 Mbit/s	42
3.5.3. F/O port 100/1000 Mbit/s (optional).....	43
3.6. Display elements.....	44
3.6.1. Device status.....	44
3.6.2. Port status.....	45
3.7. Input/output interfaces.....	46
3.7.1. Signal contact.....	46
4. Installation.....	47
4.1. Checking the package contents.....	47
4.2. Installing the SD card (optional).....	47
4.3. Mounting the device.....	48
4.3.1. Mounting the device onto the DIN rail.....	51
4.4. Grounding the device.....	52
4.5. Installing an SFP transceiver (optional).....	53
4.6. Connecting the signal contact.....	54
4.7. Connecting the supply voltage.....	54
4.7.1. Supply voltage range 12 V DC ... 24 V DC.....	55

4.7.2. Supply voltage range 24 V DC ... 48 V DC.....	56
4.7.3. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC (1 voltage input).....	57
4.7.4. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC (2 voltage inputs).....	59
4.8. Operating the device.....	61
4.9. Connecting data cables.....	62
4.10. Filling out the inscription label.....	63
5. Basic settings.....	64
5.1. Default settings.....	64
5.2. First login (Password change).....	65
6. Upgrading Software.....	66
7. Monitoring ambient conditions.....	68
7.1. Monitoring the ambient air temperature.....	68
8. Maintenance and service.....	69
9. Disassembly.....	70
9.1. Removing an SFP transceiver (optional).....	70
9.2. Removing the device.....	71
10. Technical data.....	73
10.1. General data.....	73
10.2. Supply voltage.....	73
10.2.1. Supply voltage range 12 V DC ... 24 V DC.....	73
10.2.2. Supply voltage range 24 V DC ... 48 V DC.....	74
10.2.3. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC.....	74
10.3. Power consumption/power output.....	75
10.4. Signal contact.....	76
10.5. Dimension drawings.....	77
10.5.1. Dimension drawings.....	77
10.6. Climatic conditions during operation.....	80
10.7. Climatic conditions during storage.....	81

10.8. Immunity..... 81

10.9. Electromagnetic compatibility (EMC).....81

 10.9.1. EMC interference emission..... 82

 10.9.2. EMC interference immunity..... 83

10.10. Network range..... 85

 10.10.1. Twisted-pair port 10/100/1000 Mbit/s..... 85

 10.10.2. Gigabit Ethernet SFP transceiver.....86

 10.10.3. Fast Ethernet SFP transceiver..... 88

 10.10.4. Bidirectional Fast Ethernet SFP transceiver.....89

 10.10.5. Bidirectional Gigabit Ethernet SFP transceiver..... 90

11. Scope of delivery.....92

12. Order numbers.....93

 12.1. Accessories..... 93

 12.1.1. Fast Ethernet SFP transceiver..... 93

 12.1.2. Gigabit Ethernet SFP transceiver.....94

 12.1.3. Bidirectional Fast Ethernet SFP transceiver.....95

 12.1.4. Bidirectional Gigabit Ethernet SFP transceiver..... 96

13. Underlying technical standards..... 97

Further support..... 98

1. Safety instructions

 WARNING	
	UNCONTROLLED MACHINE ACTIONS Failure to follow the instructions could result in death, serious injury, or equipment damage. To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually. Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

 AVERTISSEMENT	
	ACTIONS INCONTRÔLÉES DE LA MACHINE Le non-respect des instructions peut entraîner la mort, des blessures graves ou des dommages matériels. Pour éviter les actions incontrôlées de la machine causées par la perte de données, configurez tous les équipements de transmission de données individuellement. Avant de démarrer une machine commandée par transmission de données, assurez-vous de finaliser la configuration de tous les équipements de transmission de données.

You operate this device with electricity. Improper usage of the device entails the risk of physical injury or significant property damage. The proper and safe operation of this device depends on proper handling during transportation, proper storage and installation, and careful operation and maintenance procedures.

- Verify that the electrical installation meets local or nationally applicable safety regulations.
- Before connecting any cable, read this document, and the safety instructions and warnings.
- Operate the device with undamaged components exclusively.
- The device is free of any service components. In case of a damaged or malfunctioning device, turn off the supply voltage and return the device to Hirschmann for inspection.

1.1. Qualification requirements for personnel

Only allow qualified personnel to work on the device.

Qualified personnel have the following characteristics:

- Qualified personnel are properly trained. Training as well as practical knowledge and experience make up their qualifications. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current standards in safety technology.
- Qualified personnel are aware of the dangers that exist in their work.
- Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
- Qualified personnel receive training on a regular basis.

1.2. Intended use

- Use the product only for the application cases described in the Hirschmann Automation and Control GmbH product information, including this manual.
- This equipment is not suitable for use in locations where children are likely to be present.
- Operate the product only according to the technical specifications, see [General data on page 73](#).
- Connect to the product only components suitable for the requirements of the specific application case.

1.3. Installation site requirements

WARNING



FIRE HAZARD

Failure to follow the instructions could result in death, serious injury, or equipment damage.

If you connect the device to a power supply that does **NOT** meet the requirements for Limited Power Source, NEC Class 2 or PS2 according to IEC/EN 62368-1 and is **NOT** limited to 100 W output power, the device must be installed in either a switch cabinet or other fire enclosure.

The fire enclosure can be made of metal or plastic with fire-protection properties of at least V-1 according to IEC 60695-11-10. Bottom openings of the fire enclosure must **NOT** exceed 2 mm in diameter.

⚠ AVERTISSEMENT**RISQUE D'INCENDIE**

Le non-respect des instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

Si vous connectez l'équipement à une source d'alimentation qui n'est **PAS** conforme aux exigences d'une source d'alimentation limitée, des classes 2 ou PS2 du NEC selon la norme CEI/EN 62368-1 et qui n'est **PAS** limitée à une puissance de sortie de 100 W, l'équipement doit être installé dans une armoire électrique ou dans une autre enceinte coupe-feu.

L'enceinte coupe-feu peut être en métal ou en plastique avec des propriétés de protection contre le feu d'au moins V-1 conformément à la norme CEI 60695-11-10. Les ouvertures du fond de l'enceinte coupe-feu ne doivent **PAS** dépasser 2 mm de diamètre.

- Only for device variants featuring supply voltage with characteristic value K9 or KK:

Install this device only in a switch cabinet or in an operating site with restricted access, to which maintenance staff have exclusive access.

1.4. Device casing

Only technicians authorized by the manufacturer are permitted to open the casing.

- Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals.
- Keep the ventilation slits free to ensure good air circulation.
- Mount the device in the vertical position.
- At ambient air temperatures $> +60\text{ }^{\circ}\text{C}$ ($+140\text{ }^{\circ}\text{F}$), the surfaces of the device housing may become hot. Avoid touching the device while it is operating.

1.5. Strain relief

If the strain relief is insufficient, there is a potential risk of torsion, contact problems and creeping interruptions.

- Relieve the connection points of cables and lines from mechanical stress.
- Design strain reliefs in such a way that they help prevent any mechanical damage to cables, wires or conductors caused by external influences or their own weight.
- To help prevent damage to device connections, connectors and cables, follow the instructions for proper installation in accordance with DIN VDE 0100-520:2013-06, sections 522.6, 522.7 and 522.13.

1.6. Electrical connections

1.6.1. Grounding the device

Grounding the device is by means of a separate ground connection on the device.

- Ground the device before connecting any other cables.
- Disconnect the grounding only after disconnecting all other cables.
- Ground the device via the ground screw.

For more information on grounding the device, see [Grounding the device on page 52](#).

1.6.2. Shielding ground

The overall shield of a connected shielded twisted pair cable is connected to the grounding connector on the front panel as a conductor.

- Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

1.6.3. Requirements for connecting electrical wires

Before connecting the electrical wires, **ALWAYS** verify that the requirements listed are complied with. The following requirements apply without restriction:

- The electrical wires are voltage-free.
- The cables used are permitted for the temperature range of the application case.

1.6.4. Requirements for connecting the supply voltage

Before connecting the supply voltage, **ALWAYS** verify that the requirements listed are complied with. The following requirements apply without restrictions:

- The supply voltage corresponds to the voltage specified on the type plate of the device.
- The power supply conforms to overvoltage category I or II.
- The power supply has an easily accessible disconnecting device (for example a switch or a plug). This disconnecting device is clearly labelled and identifiable, so that in case of an emergency it is clear which power supply the disconnecting device belongs to.
- The cross-section of the ground conductor is the same size as or bigger than the cross-section of the power supply cables.
- Relevant for North America:

The power supply cables are suitable for ambient air temperatures of at least +75 °C (+167 °F). The wires of the power supply cables are made of copper.

1.6.5. Specific requirements for connecting the supply voltage

Before connecting the supply voltage, **ALWAYS** verify that the requirements listed are complied with. The following requirements apply without restrictions:

Only for device variants featuring supply voltage with the characteristic value CC:

NOTICE

MATERIAL DAMAGE

Failure to follow the instruction could result in equipment damage.

If you connect 2 independent power sources, verify that the minus terminal is grounded.

AVIS

DOMMAGE MATÉRIEL

Le non-respect de l'instruction peut entraîner des dommages matériels.

Si vous connectez deux sources d'alimentation indépendantes, vérifiez que la borne négative est mise à la terre.

The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.

The following requirements apply alternatively:

Alternative 1	The power supply complies with the requirements for a limited power source (LPS) according to IEC 60950-1 or PS2 according to IEC/EN 62368-1.
Alternative 2	Relevant for North America: The power supply complies with the requirements according to NEC Class 2.
Alternative 3	ALL of the following requirements are complied with: • The power supply complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1. • A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor. For more information on the back-up fuse, see Supply voltage range 24 V DC ... 48 V DC on page 74.

Only for device variants featuring supply voltage with the characteristic value TT:

NOTICE

MATERIAL DAMAGE
Failure to follow the instruction could result in equipment damage.

If you connect 2 independent power sources, verify that the minus terminal is grounded.

AVIS

DOMMAGE MATÉRIEL
Le non-respect de l'instruction peut entraîner des dommages matériels.

Si vous connectez deux sources d'alimentation indépendantes, vérifiez que la borne négative est mise à la terre.

The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.

The following requirements apply alternatively:

Alternative 1	The power supply complies with the requirements for a limited power source (LPS) according to IEC 60950-1 or PS2 according to IEC/EN 62368-1.
Alternative 2	ALL of the following requirements are complied with: • The power supply complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1. • A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor. For more information on the back-up fuse, see Supply voltage range 12 V DC ... 24 V DC on page 73.
Alternative 3	Relevant for North America: The power supply complies with the requirements according to NEC Class 2.

Only for device variants featuring supply voltage with the characteristic value K9 or KK:

ALL of the following requirements are complied with:

Supply with DC voltage:

- A back-up fuse suitable for DC voltage is located in the plus conductor of the power supply.
 - The minus conductor is on ground potential. Otherwise, a back-up fuse is also located in the minus conductor. For more information on the back-up fuse, see [Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC on page 74](#).
 - The wire diameter of the power supply cable is at least 1 mm² (North America: AWG16) on the supply voltage input.
-

Supply with AC voltage:

- A fuse is located in the outer conductor of the power supply.
- The neutral conductor is on ground potential at both voltage inputs. Otherwise, a fuse is also located in the neutral conductor. For more information on this fuse, see [Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC on page 74](#).
- The wire diameter of the power supply cable is at least 0.75 mm² (North America: AWG18) on the supply voltage input.

1.6.6. Requirements for connecting the signal contact

Before connecting the signal contact, **ALWAYS** verify that the requirements listed are complied with. The following requirements apply without restriction:

- The switched voltage complies with the requirements for a safety extra-low voltage (SELV) according to IEC 60950-1 or ES1 according to IEC/EN 62368-1.
- The connected voltage source is limited by a current limitation device or a fuse.
- The electrical threshold values for the signal contact are observed.

For more information, see [Signal contact on page 76](#).

1.7. Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)

The **relay connections** are to be installed and used within their Entity Parameters as per Control Drawing 000189237DNR.

WARNING: Explosion Hazard – Substitution of any components may impair suitability for Class I, Division 2.

AVERTISSEMENT : Risque d'explosion - La substitution de tout composant peut rendre ce matériel incompatible pour une utilisation en classe I, division 2.

WARNING: Explosion Hazard – Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

AVERTISSEMENT : Risque d'explosion - Ne pas débrancher l'équipement tant que le circuit est sous tension à moins que l'emplacement soit connu pour ne contenir aucune concentration de gaz inflammable.

For Use in Hazardous Locations Class I Division 2 Groups A, B, C, D: Only allowed for RSP 20/25/30/35 model No's. which are individually labeled "FOR USE IN HAZARDOUS LOCATIONS". Nonincendive field wiring circuits must be wired in accordance with the National Electrical Code (NEC), NFPA 70, article 501; CEC, Appendix J, Annex J18. The earth conductor must be at least of the same wire size (mm² or AWG) as the supply conductors. WARNING – EXPLOSION HAZARD Substitution of any components may impair suitability for hazardous locations or explosive atmospheres. WARNING – EXPLOSION HAZARD Do not disconnect equipment unless power has been switched off or the area is known to be known to be non-hazardous.		
Control Drawing for RSP devices according to Class I Division 2 Hazardous Locations		
Rev.: 0	Document No.: 000189237DNR	Page 1/2

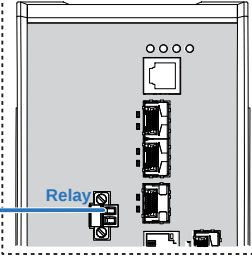


Ordinary Location,
Non-Hazardous Area,
Non-Explosive Atmosphere

↔

Explosive Atmosphere
Class I Division 2
Groups A, B, C, D
Hazardous Location

RSP



Relay contacts:
Equipment with nonincendive field wiring parameters.
Polarity is not relevant.

The relay terminals are dependent upon the following
Entity parameters:

U_i	I_i	C_i	L_i
30 V	90 mA	2 nF	1 μ H

Power Supply unit type CC: 24 VDC - 48 VDC

Power Supply unit type K9: 110 VAC - 230 VAC or
60 VDC - 250 VDC

Power Supply unit type KK: 2x 110 VAC - 230 VAC or
2x 60 VDC - 250 VDC

(Refer to the power supply code of the type designation on the device.)

Temperature Code: T4
Ambient Temperature rating:
Ta: 0 °C to +60 °C for "S" temperature types
Ta: -40 °C to +70 °C for "T" or "E" temperature types

(Refer to the temperature code of the type designation on the device.)

Control Drawing for RSP devices according to Class I Division 2 Hazardous Locations

Rev.: 0	Document No.: 000189237DNR	Page 2/2
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1.8. ATEX directive 2014/34/EU – specific regulations for safe operation

Relevant for RSP devices when operating in explosive gas atmospheres according to ATEX Directive 2014/34/EU, the following applies:

- List of standards:
 - EN IEC 60079-0:2018
 - EN 60079-7:2015 + A1:2018
 - EN IEC 60079-15:2019
- Use only device variants featuring supply voltage with characteristic value CC.
- Make sure that the device has the following label:



II 3G Ex ec nC IIC T4 Gc

DEKRA 15ATEX0017 X

Ambient temperature range and parameter:

T4: $0\text{ °C} \leq T_a \leq +60\text{ °C}$ ($+32\text{ °F} \leq T_a \leq +140\text{ °F}$) for "S" types, or

T4: $-40\text{ °C} \leq T_a \leq +70\text{ °C}$ ($-40\text{ °F} \leq T_a \leq +158\text{ °F}$) for "T" or "E" types

(item 17 of nomenclature breakdown)

- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.

- The modules shall be installed in a suitable enclosure in accordance with IEC 60079-0 providing a degree of protection of at least IP54 according to IEC 60529, taking into account the environmental conditions under which the equipment will be used.
- When the temperature under rated conditions exceeds +70 °C (+158 °F) at the cable or the conduit entry point, or +80 °C (+176 °F) at the branching point of the conductors, take measures so that the temperature specification of the selected cable and cable entries is in compliance with the actual measured temperature values.
- Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 119 V.
- Connectors shall be connected or disconnected exclusively in dead-voltage state.

1.9. IECEx – Certification Scheme for Explosive Atmospheres



For RSP devices labeled with an IECEx certificate number, the following applies:

- List of standards:
 - IEC 60079-0:2017
 - IEC 60079-7:2017
 - IEC 60079-15:2017
- Use only device variants featuring supply voltage with characteristic value CC.
- Make sure that the device has the following label:



Ex ec nC IIC T4 Gc**IECEx: DEK 15.0014 X**

Ambient temperature range and parameter:

T4: $0\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$ ($+32\text{ }^{\circ}\text{F} \leq T_a \leq +140\text{ }^{\circ}\text{F}$) for "S" types, or

T4: $-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$ ($-40\text{ }^{\circ}\text{F} \leq T_a \leq +158\text{ }^{\circ}\text{F}$) for "T" or "E" types

(item 17 of nomenclature breakdown)

- The equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.
- The modules shall be installed in a suitable enclosure according to IEC 60079-0 providing a degree of protection of at least IP54 according to IEC 60529, taking into account the environmental conditions under which the equipment will be used.
- When the temperature under rated conditions exceeds $+70\text{ }^{\circ}\text{C}$ ($+158\text{ }^{\circ}\text{F}$) at the cable or conduit entry point, or $+80\text{ }^{\circ}\text{C}$ ($+176\text{ }^{\circ}\text{F}$) at the branching point of the conductors, the temperature specification of the selected cable and cable entries shall be in compliance with the actual measured temperature values.
- Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 119 V.
- Connectors shall be connected or disconnected exclusively in dead-voltage state.

1.10. LED or laser components

LED or LASER components according to IEC 60825-1 (2014):

CLASS 1 LASER PRODUCT

CLASS 1 LED PRODUCT



WARNING: Class 1 laser product according to IEC 60825-1:2014 and EN 0825-1:2014 + A11:2021.

Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in "Laser Notice No. 56", dated May 8, 2019.

AVERTISSEMENT : Produit laser de classe 1 selon les normes CEI 60825-1:2014 et EN 0825-1:2014 + A11:2021.

Conforme aux normes 21 CFR 1040.10 et 1040.11, à l'exception de la conformité à la norme CEI 60825-1 Éd. 3., comme décrit dans le document « Laser Notice No. 56 » du 8 mai 2019.

1.11. Recycling note



The symbol of a crossed-out wheeled bin shown on the device indicates that the device **MUST NOT** be disposed of with household waste at the end of its service life.

After its service life, the used device must be disposed of properly as electronic waste in accordance with the locally applicable disposal regulations.

End users are responsible for deleting personal data from the used device prior to disposal.

End users are obliged to separate used batteries and accumulators that are not enclosed by the used device from the used device in a non-destructive manner before disposing of the used device. The used batteries and accumulators must be handed in for separate collection. This does not apply if the used device is handed in for reuse.

2. Approvals

2.1. CE marking

The labeled devices comply with the regulations contained in the following European directive(s):

- **2011/65/EU and 2015/863/EU (RoHS)**

Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

- **2014/30/EU (EMC)**

Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

- **2014/34/EU (ATEX)¹**

Directive of the European Parliament and the Council on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.

The ATEX Directive applies exclusively to the device variants labeled with an ATEX certificate number:

[*ATEX directive 2014/34/EU – specific regulations for safe operation on page 25*](#)

- **2014/35/EU²**

Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

In accordance with the above-named EU directive(s), the EU conformity declaration will be available to the relevant authorities at the following address:

1. Only for device variants featuring supply voltage with characteristic value CC

2. Only for device variants featuring supply voltage with characteristic value K9 or KK

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany

You can download the PDF file of the EU conformity declaration at <https://www.doc.hirschmann.com/certificates.html>.

The device can be used in industrial environments.

- Interference immunity: EN 61000-6-2
- Emitted interference: EN 55032
- Safety: IEC/EN 62368-1

For more information on technical data, see [General data on page 73](#).

The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

WARNING: This is a Class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

AVERTISSEMENT : Ce produit est un équipement de la classe A. Ce produit peut provoquer des interférences dans les habitations. Dans ce cas, l'exploitant peut être tenu de procéder aux mesures appropriées.

2.2. FCC note

Supplier's Declaration of Conformity

47 CFR § 2.1077 Compliance Information

RSP20/25/30/35

U.S. Contact Information

Belden Inc. – St. Louis
1 N Brentwood Blvd. 15th Floor
St. Louis, Missouri 63105,
United States
Phone: 314.854.8000

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

3. Description

The device is designed for the special requirements of industrial automation. The device meets the relevant industry standards, provides very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The device works without a fan.

You can choose from a wide range of variants. You can set up your device individually based on different criteria:

- Number of ports
- Transmission speed
- Types of connectors
- Temperature range
- Supply voltage range
- Certifications
- Redundancy functions

Type of the device mounting:

- Mounting on a DIN rail

You can choose various media to connect to the end devices and other network components:

- Twisted-pair cable
- Multimode F/O (Fiber Optic)
- Singlemode F/O (Fiber Optic)

The redundancy concept allows the network to be reconfigured quickly.

There are convenient options for managing the device. Manage your devices via:

- Web browser
- SSH
- Telnet
- Network management software (for example Industrial HiVision)

The Network Management Software Industrial HiVision provides you with options for smooth configuration and monitoring. For more information, see <https://www.belden.com/products/industrial-networking-cybersecurity/software-solutions/network-management-software/industrial-hivision-network-management-software>.

- V.24 interface (locally on the device)

The device provides you with a large range of functions, which the Manual Collection (User and Reference Manuals) for the operating software informs you about. For more information, see doc.hirschmann.com.

The Hirschmann network components help you ensure continuous communication across all levels of the company.

3.1. Device name and product code

The device name corresponds to the product code. The product code is made up of characteristics with defined positions. The characteristic values stand for specific product properties.

You have numerous options of combining the device characteristics. You can determine the possible combinations using the configurator which is available in the Belden Online Catalog catalog.belden.com on the web page of the device.

Table 1. Device name and product code

Item	Characteristic	Characteristic value	Description
1 ... 5	Product	RSP20	Fast Ethernet switch
		RSP25	Fast Ethernet switch with extended redundancy function
		RSP30	Gigabit Ethernet switch
		RSP35	Gigabit Ethernet switch with extended redundancy function
6	(hyphen)	–	
7 ... 8	Number Fast Ethernet ports	08	8 ×
		11	11 ×
9 ... 10	Number Gigabit Ethernet ports	00	0 ×
		03	3 ×
11 ... 13	Configuration of the up-link ports	3Z6	3 × Optional SFP slot for: • 100 Mbit/s twisted pair connections • 100 Mbit/s F/O connections
		3O6	3 × Optional SFP slot for: • 100 Mbit/s twisted pair connections • 1000 Mbit/s twisted pair connections • 100 Mbit/s F/O connections • 1000 Mbit/s F/O connections
14 ... 15	Configuration of the other ports	TT	8 × RJ45 socket for 10/100 Mbit/s twisted pair connections
		ZT	4 × RJ45 socket for 10/100 Mbit/s twisted pair connections
			4 × Optional SFP slot for:

Table 1. Device name and product code (continued)

Item	Characteristic	Characteristic value	Description	
			• 100 Mbit/s twisted pair connections • 100 Mbit/s F/O connections	
16	(hyphen)	–		
17	Temperature range	S	Standard	0 °C ... +60 °C (+32 °F ... +140 °F)
		T	Extended	-40 °C ... +70 °C (-40 °F ... +158 °F)
		E	Extended with Confor- mal Coating	-40 °C ... +70 °C (-40 °F ... +158 °F)
18 ... 19	Supply voltage	CC	2 voltage inputs for redundant power supply	
			Rated voltage range DC: 24 V DC ... 48 V DC	
		K9	1 voltage input	
			Rated voltage range AC: 110 V AC ... 230 V AC, 50 Hz ... 60 Hz	
			Rated voltage range DC: 60 V DC ... 250 V DC	
		KK	2 voltage inputs for redundant power supply	
			Rated voltage range AC: 110 V AC ... 230 V AC, 50 Hz ... 60 Hz	
			Rated voltage range DC: 60 V DC ... 250 V DC	
		TT	2 voltage inputs for redundant power supply	
			Rated voltage range DC: 12 V DC ... 24 V DC	
20 ... 21	Certificates and declara- tions	You will find detailed information on the certificates and declarations applying to your device in a separate overview: Table 2 on page 36		
22 ... 23	Customer-specific ver- sion	HS	Hirschmann	Standard
		HM	Hirschmann	Fast MRP
		HP	Hirschmann	PRP
		HH	Hirschmann	HSR
		HD	From software version 05.0 onward:	
			Hirschmann	DLR

Table 1. Device name and product code (continued)

Item	Characteristic	Characteristic value	Description
Note: You can exchange software with each other on the following device variants: • HM • HP • HH			
24	Software configuration	E	Entry (without configuration)
25 ... 26	Software level	2S	HiOS Layer 2 Standard
		2A	HiOS Layer 2 Advanced
		3S	HiOS Layer 3 Standard
27 ... 31	Software version	02.0.	Software version 02.0
		XX.X.	Current software version

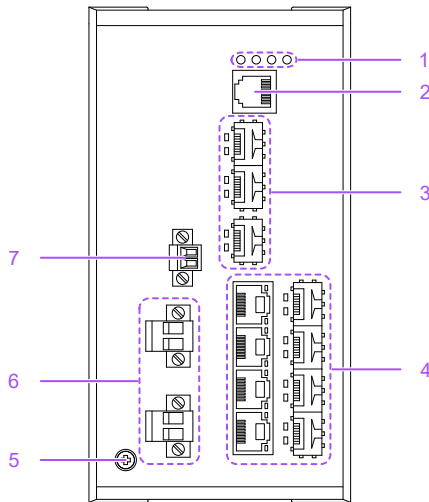
Table 2. Assignment: application cases, certificates and declarations, characteristic values

Application case	Certificates and declarations	Characteristic value									
		TY	T9	WD	WC	WB	WA	V9	VY	Y9	Z9
Standard applications	ATEX/IECEX, Zone 2			X	X	X	X				
	CE	X	X	X	X	X	X	X	X	X	X
	FCC	X	X	X	X	X	X	X	X	X	X
	ANSI/UL 121201			X	X						
	EN 61131-2	X	X	X	X	X	X	X	X	X	X
	UL 508	X							X	X	
Substation applications	IEC 61850-3							X	X		
	IEEE 1613							X	X		
Navy applications	DNV			X		X					
Railway applications (trackside)	EN 50121-4	X	X	X		X					

3.2. Device views

3.2.1. Front view

Figure 1. Front view (using the example RSP20-11003Z6ZT-SCC...)



1	LED display elements for device status
2	V.24 interface
3	Depending on device variant: RSP20/RSP25 3 × SFP slot for 100 Mbit/s connections RSP30/RSP35 3 × SFP slot for 100/1000 Mbit/s connections
4	8 × 10/100 Mbit/s twisted pair port or 4 × 10/100 Mbit/s twisted pair port and 4 × SFP slot for 100 Mbit/s connections
5	Grounding screw
6	Supply voltage connection, depending on device variant:

Supply voltage with the characteristic value:
CC

- 2 voltage inputs for redundant power supply
- 2-pin terminal block

Supply voltage with the characteristic value:
K9

- 1 voltage input
- 3-pin terminal block

Supply voltage with the characteristic value:
KK

- 2 voltage inputs for redundant power supply
- 3-pin terminal block

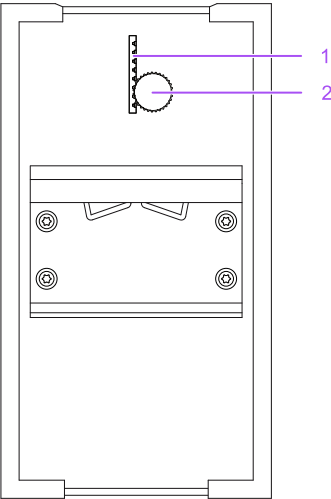
Supply voltage with the characteristic value:
TT

- 2 voltage inputs for redundant power supply
- 2-pin terminal block

7 Connection for the signal contact

3.2.2. Rear view

Figure 2. Rear view



1	Slot for the SD card
2	Thumb screw

3.3. Power supply

The following options for power supply are available:

3.3.1. Supply voltage range 12 V DC ... 24 V DC

Corresponds to the supply voltage characteristic value TT. For more information, see [Device name and product code on page 34](#).

- 2 × 2-pin terminal block

For more information on connecting the supply voltage, see [Supply voltage range 12 V DC ... 24 V DC on page 55](#).

3.3.2. Supply voltage range 24 V DC ... 48 V DC

Corresponds to the supply voltage characteristic value CC. For more information, see [Device name and product code on page 34](#).

- 2 × 2-pin terminal block

For more information on connecting the supply voltage, see [Supply voltage range 24 V DC ... 48 V DC on page 56](#).

3.3.3. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC (1 voltage input)

Corresponds to the supply voltage characteristic value K9. For more information, see [Device name and product code on page 34](#).

- 1 × 3-pin terminal block

For more information on connecting the supply voltage, see [Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC \(1 voltage input\)](#) on page 57.

3.3.4. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC (2 voltage inputs)

Corresponds to the supply voltage characteristic value KK. For more information, see [Device name and product code](#) on page 34.

- 2 × 3-pin terminal block

For more information on connecting the supply voltage, see [Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC \(2 voltage inputs\)](#) on page 59.

3.4. Management Interfaces

3.4.1. V.24 interface (external management)

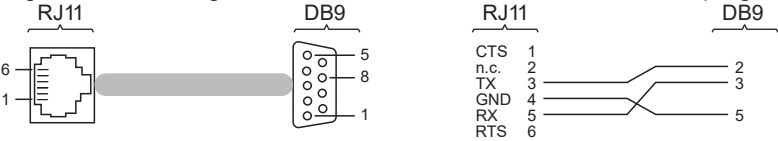
A serial interface is provided on the RJ11 socket (V.24 interface) for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables you to set up a connection to the Command Line Interface CLI and to the System Monitor.

The terminal cable is available as an accessory, see [Accessories](#) on page 93.

VT100 terminal settings	
Speed	9600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front panel of the device. The V.24 interface is electrically insulated from the supply voltage.

Figure 3. Pin assignment of the V.24 interface and the DB9 plug



3.4.2. SD card interface

Prerequisite:

Only use Hirschmann SD cards.

The SD card interface allows you to connect the AutoConfiguration Adapter ACA31 storage medium. This is used for saving/loading the configuration data and diagnostic information, and for loading the software.

The AutoConfiguration Adapter is available as an accessory, see [Accessories on page 93](#).

For information about the position on the device, see [Rear view on page 38](#).

On the front of the device there is an LED display that informs you about the status of the interface.

3.5. Ethernet ports

You can connect end devices and other segments to the device ports using twisted pair cables or optical fibers (F/O).

3.5.1. Twisted-pair port 10/100 Mbit/s

This port is an RJ45 socket.

The 10/100 Mbit/s twisted-pair port allows you to connect network components according to IEEE 802.3 10BASE-T/100BASE-TX.

This port supports:

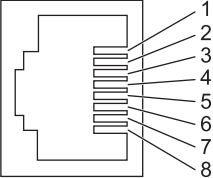
- Auto-Negotiation
- Autopolarity
- Auto-Crossover (if Auto-Negotiation is enabled)
- 100 Mbit/s half duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half duplex mode, 10 Mbit/s full duplex mode

Delivery state:

- Autonegotiation enabled

The port casing is electrically connected to the front panel.

Table 3. Pin assignment 10/100 Mbit/s twisted-pair port, RJ45 socket, MDI and MDI-X mode

RJ45	Pin	10/100 Mbit/s	Function
	1	RD+	Receive path
	2	RD-	Receive path
	3	TD+	Transmission path
	6	TD-	Transmission path
	4, 5, 7, 8	-	-

3.5.2. F/O port 100 Mbit/s

This port is an SFP slot.

The 100 Mbit/s F/O port allows you to connect network components according to the IEEE 802.3 100BASE-FX standard.

This port supports:

- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode

Default setting: Full duplex

3.5.3. F/O port 100/1000 Mbit/s (optional)

This port is an SFP slot.

The port allows you to connect network components according to standard IEEE 802.3 100BASE-FX/1000BASE-SX/1000BASE-LX.

This port supports:

- 1000 Mbit/s full duplex mode
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode

Delivery state:

- 1000 Mbit/s full duplex mode when using a Gigabit Ethernet SFP transceiver
- 100 Mbit/s full duplex mode when using a Fast Ethernet SFP transceiver

3.6. Display elements

After the supply voltage is set up, the software starts and initializes the device. Afterwards, the device performs a self-test. During this process, various LEDs light up.

3.6.1. Device status

These LEDs provide information about conditions which affect the operation of the whole device.

Figure 4. LED display elements for device status



Table 4. Power LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Supply voltage is too low or not available
yellow	flashes 4 × a period	Software update is running. Maintain the power supply
yellow	lights up	Device variants with redundant power supply Supply voltage 1 or 2 is on
green	lights up	Device variants with redundant power supply Supply voltage 1 and 2 is on
green	lights up	Device variants with single power supply Supply voltage is on

Table 5. Status LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Device is starting and/or is not ready for operation
red	lights up ³	Device is ready for operation Device has detected at least one error in the monitoring results
red	lights up ⁴	Device is inoperative.
red	flashes 1 × a period	The boot parameters used when the device has been started differ from the boot parameters saved. Start the device again.

3. Applies to software releases **after** 02.0.00.

4. Applies to software releases **before** 02.0.00.

Table 5. Status LED: Color, activity and meaning (continued)

Color	Activity	Meaning
red	flashes 4 × a period ⁵	Device has detected a multiple IP address
green	lights up	Device is ready for operation Characteristics can be configured

Table 6. ACA LED: Color, activity and meaning

Color	Activity	Meaning
none	none	ACA storage medium not connected
yellow	lights up	ACA storage medium inoperative
green	lights up	ACA storage medium connected
green	flashes 3 × a period	Device writes to/reads from the storage medium

Table 7. Redundancy Manager (RM) LED: Color, activity and meaning

Color	Activity/Status	Meaning
none	none	No redundancy configured
yellow	lights up	No redundancy exists
green	lights up	Redundancy exists
green	flashes 1 × a period	Device is reporting an incorrect configuration of the RM function

3.6.2. Port status

These LEDs display port-related information.

The LEDs are directly located on the ports.

Table 8. Port status LED: Color, activity and meaning

Color	Activity	Meaning
none	none	Device detects an invalid or missing link
yellow	flashing	Device is transmitting and/or receiving data
yellow	flashes 1 × a period ⁶	Device detects at least one unauthorized MAC address (Port Security Violation)

5. Applies to software releases **after** 02.0.00.

6. Applies to software releases **after** 02.0.00.

Table 8. Port status LED: Color, activity and meaning (continued)

Color	Activity	Meaning
yellow	flashes 3 × a period ⁷	The device deactivates the relevant port (auto-deactivation)
yellow	lights up ⁸	Device detects a non-supported SFP transceiver or a non-supported data rate
green	lights up	Device detects a valid link
green	flashes 1 × a period	Port is switched to stand-by
green	flashes 3 × a period	Port is switched off

3.7. Input/output interfaces

3.7.1. Signal contact

Figure 5. Signal contact: 2-pin terminal block with screw locking



The signal contact is a potential-free relay contact. When the device is not connected to a power supply, the signal contact is open.

The signal contact allows you to control external devices or monitor device functions.

In the configuration, you specify how the device uses the signal contact.

You will find detailed information on possible applications and the configuration of the signal contact in the Manual Collection (User and Reference Manuals) at [doc.hirschmann.com](https://www.hirschmann.com/doc).

7. Applies to software releases **after** 02.0.00.
8. Applies to software releases **after** 02.0.00.

4. Installation

The devices have been developed for practical application in a harsh industrial environment.

On delivery, the device is ready for operation.

To install and configure the device, perform the following steps:

- [Checking the package contents on page 47](#)
- [Installing the SD card \(optional\) on page 47](#)
- [Mounting the device on page 48](#)
- [Grounding the device on page 52](#)
- [Installing an SFP transceiver \(optional\) on page 53](#)
- [Connecting the signal contact on page 54](#)
- [Connecting the supply voltage on page 54](#)
- [Operating the device on page 61](#)
- [Connecting data cables on page 62](#)
- [Filling out the inscription label on page 63](#)

4.1. Checking the package contents

- Check whether the package includes all items named in [Scope of delivery on page 92](#).
- Check the individual parts for transport damage.

4.2. Installing the SD card (optional)

Note: Only use the AutoConfiguration Adapter ACA31 storage medium. For more information, see [Accessories on page 93](#).

Perform the following steps:

- Deactivate the write protection on the SD card by pushing the write-protect lock towards the contacts of the card.
- Push the SD card into the slot with the beveled corner on the front left side.
- Tighten the thumb screw hand-tight to fix the SD card.

4.3. Mounting the device

 WARNING**FIRE HAZARD**

Failure to follow the instructions could result in death, serious injury, or equipment damage.

If you connect the device to a power supply that does **NOT** meet the requirements for Limited Power Source, NEC Class 2 or PS2 according to IEC/EN 62368-1 and is **NOT** limited to 100 W output power, the device must be installed in either a switch cabinet or other fire enclosure.

The fire enclosure can be made of metal or plastic with fire-protection properties of at least V-1 according to IEC 60695-11-10. Bottom openings of the fire enclosure must **NOT** exceed 2 mm in diameter.

 AVERTISSEMENT**RISQUE D'INCENDIE**

Le non-respect des instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

Si vous connectez l'équipement à une source d'alimentation qui n'est **PAS** conforme aux exigences d'une source d'alimentation limitée, des classes 2 ou PS2 du NEC selon la norme CEI/EN 62368-1 et qui n'est **PAS** limitée à une puissance de sortie de 100 W, l'équipement doit être installé dans une armoire électrique ou dans une autre enceinte coupe-feu.

L'enceinte coupe-feu peut être en métal ou en plastique avec des propriétés de protection contre le feu d'au moins V-1 conformément à la norme CEI 60695-11-10. Les ouvertures du fond de l'enceinte coupe-feu ne doivent **PAS** dépasser 2 mm de diamètre.

 WARNING**ELECTRIC SHOCK**

Failure to follow the instructions could result in death, serious injury, or equipment damage.

Exclusively install this device in a switch cabinet or in a restricted access location according to IEC/EN 62368-1, to which maintenance staff have exclusive access.

 AVERTISSEMENT**CHOC ÉLECTRIQUE**

Le non-respect des instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

Installez cet équipement exclusivement dans une armoire électrique ou dans un emplacement à accès restreint conformément à la norme CEI/EN 62368-1, auquel seul le personnel de maintenance a accès.

4.3.1. Mounting the device onto the DIN rail

The device is designed to be mounted on a 35 mm (1.38 in) horizontally mounted DIN rail according to DIN EN 60715.

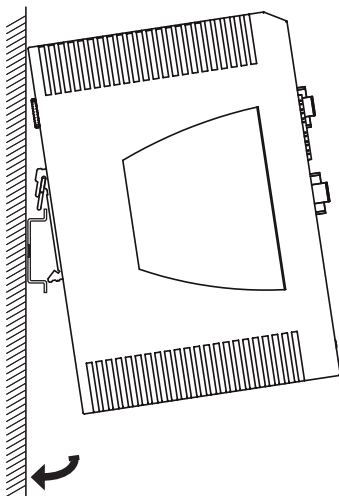
Prerequisites:

Verify that the device maintains the minimum clearance to meet the climatic conditions during operation:

- Top and bottom sides of device: 10 cm (3.94 in)
- Left and right device side: 2 cm (0.79 in)

Decreasing the minimum clearance reduces the specified maximum operating temperature. For more information, see [Climatic conditions during operation on page 80](#).

Perform the following steps:



- Slide the upper snap-in guide of the device onto the DIN rail.
- Push the device downwards and onto the DIN rail.
- Snap in the device.

Note: The overall shield of a connected shielded twisted pair cable is connected to the grounding connector on the front panel as a conductor.

4.4. Grounding the device

The device is grounded via the separate ground screw on the bottom left of the front side of the device. For more information, see [Front view on page 37](#).

The device variants featuring supply voltage with characteristic value K9 and KK have a connection for protective grounding.

The device variants featuring supply voltage with characteristic value CC and TT have a connection for functional grounding.

For more information on the characteristic values, see [Device name and product code on page 34](#).

Perform the following steps:

1. Ground the device via the grounding screw.

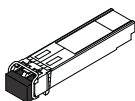
4.5. Installing an SFP transceiver (optional)

Prerequisites:

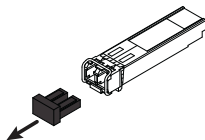
Exclusively use Hirschmann SFP transceivers. Transceivers are available as accessories, see [Accessories on page 93](#).

Perform the following steps:

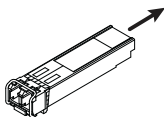
1. Take the SFP transceiver out of the transport packaging.



2. Remove the protection cap from the SFP transceiver.



3. Push the SFP transceiver with the lock closed into the slot until it latches in.



4.6. Connecting the signal contact

Perform the following steps:

- 1. Connect the signal contact lines with the terminal block connections.
- 2. Fasten the wires in the terminal block by tightening the terminal screws.

For information on the prescribed tightening torque, see [Signal contact on page 76](#).

- 3. Mount the terminal block on the device using screws.

4.7. Connecting the supply voltage

Before connecting the electrical wires, **always** verify that the requirements listed are complied with. For more information, see [Requirements for connecting electrical wires on page 17](#).

The supply voltage is connected to the device casing through protective elements exclusively.

 **WARNING**



ELECTRIC SHOCK

Failure to follow the instruction could result in death, serious injury, or equipment damage.

Never insert sharp or pointed objects (screwdrivers, wires, etc.) into the connection terminals for electric conductors. Do not touch the connection terminals.



 **AVERTISSEMENT**

CHOC ÉLECTRIQUE
Le non-respect de l'instruction peut entraîner la mort, des blessures graves ou des dommages matériels.

N'insérez jamais d'objets coupants ou pointus (tournevis, fils, etc.) dans les bornes de raccordement pour les conducteurs électriques. Ne touchez pas aux bornes de raccordement.

4.7.1. Supply voltage range 12 V DC ... 24 V DC

Corresponds to the supply voltage characteristic value TT. For more information, see [Device name and product code on page 34](#).

You have the option of supplying the supply voltage redundantly, without load distribution. Both supply voltage inputs are uncoupled.

Figure 6. 2-pin terminal block with screw lock

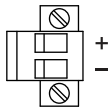


Table 9. Type and specification of the supply voltage, pin assignment on the device

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage range 12 V DC ... 24 V DC	+	Plus terminal of the supply voltage
	Voltage range including maximum tolerances 10.2 V DC ... 32 V DC	-	Minus terminal of the supply voltage

For **every** supply voltage to be connected, perform the following steps:

- Remove the terminal block from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.

For information on the prescribed tightening torque, see [Supply voltage range 12 V DC ... 24 V DC on page 73](#).

With a non-redundant supply of the supply voltage, the device reports the loss of a supply voltage. You can prevent this message by applying the supply voltage via both inputs, or by changing the configuration in the Management.

4.7.2. Supply voltage range 24 V DC ... 48 V DC

Corresponds to the supply voltage characteristic value CC. For more information, see [Device name and product code on page 34](#).

You have the option of supplying the supply voltage redundantly, without load distribution. Both supply voltage inputs are uncoupled.

Figure 7. 2-pin terminal block with screw lock

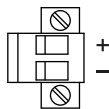


Table 10. Type and specification of the supply voltage, pin assignment on the device

Type of the voltages that can be connected	Specification of the supply voltage	Pin assignment
DC voltage	Rated voltage range 24 V DC ... 48 V DC Voltage range including maximum tolerances 18 V DC ... 60 V DC	+ Plus terminal of the supply voltage - Minus terminal of the supply voltage

For **EVERY** supply voltage to be connected, perform the following steps:

- Remove the terminal block from the device.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.

For information on the prescribed tightening torque, see [Supply voltage range 24 V DC ... 48 V DC on page 74](#).

With a non-redundant supply of the supply voltage, the device reports the loss of a supply voltage. You can prevent this message by applying the supply voltage via both inputs, or by changing the configuration in the Management.

4.7.3. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC (1 voltage input)

Corresponds to the supply voltage characteristic value K9. For more information, see [Device name and product code on page 34](#).

Figure 8. 3-pin terminal block with screw lock



Table 11. Type and specification of the supply voltage, pin assignment on the device

Type of the volt- ages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage range 60 V DC ... 250 V DC Voltage range including maximum tolerances 48 V DC ... 320 V DC	+/L	Plus terminal of the supply voltage
		-/N	Minus terminal of the supply voltage
			Protective conductor
AC voltage	Rated voltage range 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Voltage range including maximum tolerances 88 V AC ... 265 V AC, 47 Hz ... 63 Hz	+/L	Outer conductor
		-/N	Neutral conductor
			Protective conductor

 WARNING



ELECTRIC SHOCK
Failure to follow the instructions could result in death, serious injury, or equipment damage.

Exclusively install this device in a switch cabinet or in a restricted access location according to IEC/EN 62368-1, to which maintenance staff have exclusive access.

 AVERTISSEMENT



CHOC ÉLECTRIQUE
Le non-respect des instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

Installez cet équipement exclusivement dans une armoire électrique ou dans un emplacement à accès restreint conformément à la norme CEI/EN 62368-1, auquel seul le personnel de maintenance a accès.

For supply voltage to be connected, perform the following steps:

- Remove the terminal block from the device.
- Connect the protective conductor with the clamp.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.

For information on the prescribed tightening torque, see [Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC on page 74](#).

4.7.4. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC (2 voltage inputs)

Corresponds to the supply voltage characteristic value KK. For more information, see [Device name and product code on page 34](#).

You have the option of supplying the supply voltage redundantly, without load distribution. Both supply voltage inputs are uncoupled.

With a redundant supply, the supply voltage 1 (upper voltage input on the device) has priority.

Figure 9. 3-pin terminal block with screw lock



Table 12. Type and specification of the supply voltage, pin assignment on the device

Type of the volt- ages that can be connected	Specification of the supply voltage	Pin assignment	
DC voltage	Rated voltage range 60 V DC ... 250 V DC Voltage range including maximum tolerances 48 V DC ... 320 V DC	+/L	Plus terminal of the supply voltage
		-/N	Minus terminal of the supply voltage
			Protective conductor
AC voltage	Rated voltage range 110 V AC ... 230 V AC, 50 Hz ... 60 Hz Voltage range including maximum tolerances 88 V AC ... 265 V AC, 47 Hz ... 63 Hz	+/L	Outer conductor
		-/N	Neutral conductor
			Protective conductor

 WARNING



ELECTRIC SHOCK
**Failure to follow the instructions could result
in death, serious injury, or equipment damage.**

Exclusively install this device in a switch cabinet or in a
restricted access location according to IEC/EN 62368-1, to
which maintenance staff have exclusive access.

 AVERTISSEMENT



CHOC ÉLECTRIQUE
**Le non-respect des instructions peut entraîner
la mort, des blessures graves ou des
dommages matériels.**

Installez cet équipement exclusivement dans une armoire
électrique ou dans un emplacement à accès restreint
conformément à la norme CEI/EN 62368-1, auquel seul le
personnel de maintenance a accès.

For **every** supply voltage to be connected, perform the following steps:

- Remove the terminal block from the device.
- Connect the protective conductor with the clamp.
- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires in the terminal block by tightening the terminal screws.

For information on the prescribed tightening torque, see [Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC on page 74](#).

With a non-redundant supply of the supply voltage, the device reports the loss of a supply voltage. You can prevent this message by changing the configuration in the Management.

4.8. Operating the device

Before connecting the electrical wires, **always** verify that the requirements listed are complied with. For more information, see [Requirements for connecting electrical wires on page 17](#).

 WARNING	
	ELECTRIC SHOCK Failure to follow the instruction could result in death, serious injury, or equipment damage. Ground the device before connecting any other cables.

 AVERTISSEMENT	
	CHOC ÉLECTRIQUE Le non-respect de l'instruction peut entraîner la mort, des blessures graves ou des dommages matériels. Mettez l'équipement à la terre avant de connecter tout autre câble.

Relevant for North America:

You find the prescribed tightening torque in [General data on page 73](#).

Perform the following steps:

- Use screws to secure the connectors to the device.
- Enable the supply voltage.

4.9. Connecting data cables

Note the following general recommendations for data cable connections in environments with high electrical interference levels:

- Keep the length of the data cables as short as possible.
- Use optical data cables for the data transmission between buildings.
- When using copper cables, provide a sufficient separation between the power supply cables and the data cables. Ideally, install the cables in separate cable ducts.
- Verify that power supply cables and data cables do not run parallel over longer distances. If reducing the inductive coupling is necessary, verify that the power supply cables and data cables cross at a 90° angle.
- Use shielded data cables for gigabit transmission via copper cables, for example SF/UTP cables according to ISO/IEC 11801. Exclusively use shielded data cables to meet EMC requirements according to EN 50121-4 and marine applications.
- Connect the data cables according to your requirements. For more information, see [Ethernet ports on page 41](#).

4.10. Filling out the inscription label

The information field for the IP address helps you identify your device.

5. Basic settings

The IP parameters must be entered when the device is installed for the first time. The device provides the following options for configuring IP addresses:

- AutoConfiguration Adapter
- Configuration via BOOTP
- Configuration via DHCP (Option 82)
- Input via the V.24 interface
- Input via the Industrial HiVision application. You find further information about the application Industrial HiVision at:

Industrial HiVision

<https://www.belden.com/products/industrial-networking-cybersecurity/software-solutions/network-management-software/industrial-hivision-network-management-software>

5.1. Default settings

- Ethernet ports: link status is not evaluated (signal contact)
- IP address: The device looks for its IP address parameters using DHCP
- Management password:
Login: user, password: public (read only)
Login: admin, password: private (read/write)
- Optical ports: Full duplex
- Twisted-pair ports: Autonegotiation
- Rapid Spanning Tree Protocol (RSTP): enabled
- V.24 data rate: 9600 Baud

5.2. First login (Password change)

To help prevent undesired access to the device, it is imperative that you change the default password during initial setup.

Perform the following steps:

- Open the Graphical User Interface or the Command Line Interface the first time you log on to the device.
- Log on to the device with the default password "private". On successful login, the device prompts you to type in a new password.
- Type in your new password.

To help increase security, choose a password that contains at least 8 characters which includes upper-case characters, lower-case characters, numerical digits, and special characters.

- When you log on to the device with the Command Line Interface, the device prompts you to confirm your new password.
- Log on to the device again with your new password.

Note: If you lost your password, use the System Monitor to reset the password.

6. Upgrading Software

The upgrade options for RSP device depend on the software level of the device. For more information, see [Device name and product code on page 34](#).

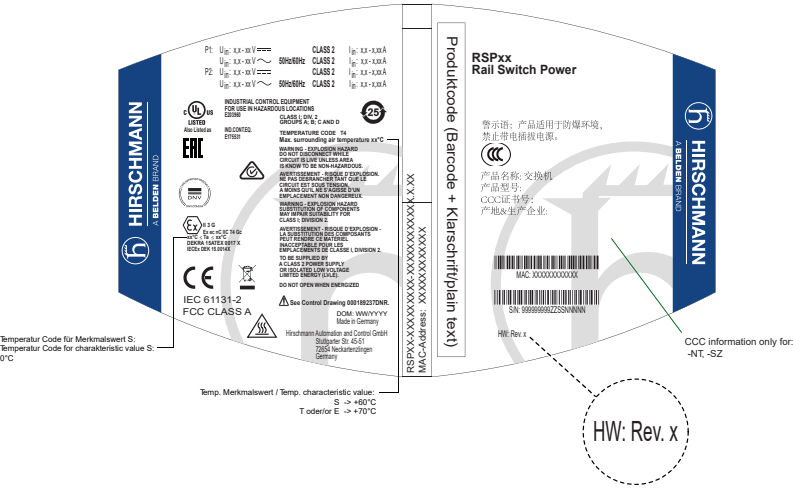
Note: For software version 04.0 or higher, "HiOS" is available as a common software image for the software levels 2A and 3S. You select only the desired redundancy function during the installation of the image. After finishing the installation and manually restarting the device, the device automatically activates the functions of the software level saved in the product code. For the software level 2S, the software image "HiOS-2S" remains available.

Table 13. Upgrade options

Software version		Software level according to the product code		
		2S	2A	3S
HiOS 02.0	Name of the software image	HiOS-2S	–	–
	Range of functions corresponds to	2S	–	–
HiOS 03.0	Name of the software image	HiOS-2S	HiOS-2A	HiOS-2A
	Range of functions corresponds to	2S	2A	2A
From HiOS 04.0 onward	Name of the software image	HiOS-2S	HiOS	HiOS
	Range of functions corresponds to	2S	2A	3S

Note: RSP device variants with the software level characteristic value 2S marked as "HW: Rev.3" only support software version 8.6. and higher. RSP device variants marked as "HW: Rev.4" only support software version 10.3.03 and higher. The device variants provide you with a larger range of functions. Refer to the side label on your device [Figure 10: Revision marking on the side label on page 67](#) for the revision marking.

Figure 10. Revision marking on the side label



7. Monitoring ambient conditions

7.1. Monitoring the ambient air temperature

Operate the device below the specified maximum ambient air temperature exclusively.

For more information, see [Climatic conditions during operation on page 80](#).

The ambient air temperature is the temperature of the air at a distance of 5 cm (2 in) from the device. It depends on the installation conditions of the device, for example the distance from other devices or other objects, and the output of neighboring devices.

The temperature displayed in the CLI (Command Line Interface) and the GUI (Graphical User Interface) is the internal temperature of the device. It is higher than the ambient air temperature.

The maximum internal temperature of the device named in the technical data is a guideline that indicates to you that the maximum ambient air temperature has possibly been exceeded.

8. Maintenance and service

- When designing this device, Hirschmann largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- Relays are subject to natural wear. This wear depends on the frequency of the switching operations.

Check the resistance of the closed relay contacts and the switching function depending on the frequency of the switching operations.

- Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads at:
www.belden.com
- Depending on the pollution degree in the operating environment, check regularly that the ventilation slots in the device are not obstructed.

You find information on settling complaints at:

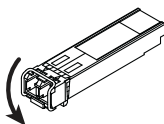
<https://my.belden.com>

9. Disassembly

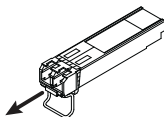
9.1. Removing an SFP transceiver (optional)

Perform the following steps:

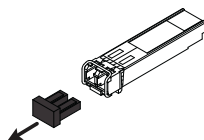
1. Open the locking mechanism of the SFP transceiver.



2. Pull the SFP transceiver out of the slot via the open locking mechanism.



3. Close the SFP transceiver with the protection cap.



9.2. Removing the device



WARNING



ELECTRIC SHOCK
Failure to follow the instructions could result in death, serious injury, or equipment damage.

Disconnect the grounding only after disconnecting all other cables.



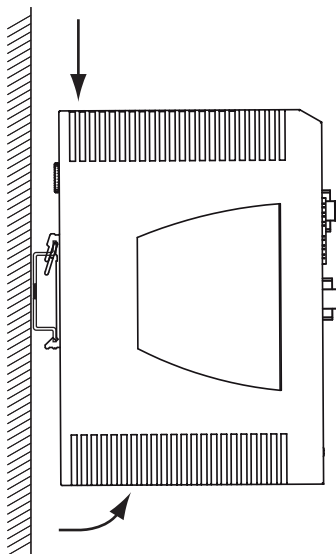
AVERTISSEMENT



CHOC ÉLECTRIQUE
Le non-respect des instructions peut entraîner la mort, des blessures graves ou des dommages matériels.

Ne débranchez la mise à la terre qu'après avoir débranché tous les autres câbles.

Perform the following steps:



- Disconnect the data cables.
- Disable the supply voltage.
- Disconnect the terminal blocks.
- Disconnect the grounding.
- To remove the device from the DIN rail, press the device downwards and pull it out from under the DIN rail.

10. Technical data

10.1. General data

Dimensions	See Dimension drawings on page 77 .	
Weight	RSP 20/25/30/35-.....TT-S.....	approx. 1.2 kg (2.65 lb)
	RSP 20/25/30/35-.....TT-T.....	approx. 1.5 kg (3.31 lb)
	RSP 20/25/30/35-.....TT-E.....	
	RSP 20/25/30/35-.....ZT-S.....	approx. 1.3 kg (2.86 lb)
	RSP 20/25/30/35-.....ZT-T.....	approx. 1.6 kg (3.52 lb)
	RSP 20/25/30/35-.....ZT-E.....	
Pollution degree	2	
Laser protection	Class 1 in compliance with IEC 60825-1	
Degree of protection	IP20	

10.2. Supply voltage

10.2.1. Supply voltage range 12 V DC ... 24 V DC

Corresponds to the supply voltage characteristic value TT. For more information, see [Device name and product code on page 34](#).

Rated voltage range DC:	12 V DC ... 24 V DC	
Voltage range DC incl. maximum tolerances:	10.2 V DC ... 32 V DC	
Connection type	2-pin terminal block	
	Tightening torque	0.51 Nm (4.5 lb-in)
Power loss buffer	>10 ms at 10.2 V DC	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	At rated voltage DC	12 V DC
	Nominal rating:	5 A
	Characteristic:	slow blow
	At rated voltage DC	24 V DC
	Nominal rating:	4 A

	Characteristic:	slow blow
Peak inrush current	<14 A	

10.2.2. Supply voltage range 24 V DC ... 48 V DC

Corresponds to the supply voltage characteristic value CC. For more information, see [Device name and product code on page 34](#).

Rated voltage range DC:	24 V DC ... 48 V DC	
Voltage range DC incl. maximum tolerances:	18 V DC ... 60 V DC	
Connection type	2-pin terminal block	
	Tightening torque	0.51 Nm (4.5 lb-in)
Power loss buffer	>10 ms at 20.4 V DC	
Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	2 A
	Characteristic:	slow blow
Peak inrush current	<4 A	

10.2.3. Supply voltage range 110 V AC ... 230 V AC, 60 V DC ... 250 V DC

Corresponds to the supply voltage characteristic value K9 and KK. For more information, see [Device name and product code on page 34](#).

Rated voltage range AC:	110 V AC ... 230 V AC 50 Hz ... 60 Hz	
Voltage range AC incl. maximum tolerances:	88 V AC ... 265 V AC 47 Hz ... 63 Hz	
Rated voltage range DC:	60 V DC ... 250 V DC	
Voltage range DC incl. maximum tolerances:	48 V DC ... 320 V DC	
Connection type	3-pin terminal block	
	Tightening torque	0.51 Nm (4.5 lb-in)
Power loss buffer	>10 ms at 98 V AC >10 ms at 51 V DC	

Overload current protection on the device	Non-replaceable fuse	
Back-up fuse for each voltage input	Nominal rating:	1 A ... 20 A
	Characteristic:	slow blow
Peak inrush current	<3.5 A	

10.3. Power consumption/power output

The order numbers correspond to the product codes of the devices. For more information, see [Device name and product code on page 34](#).

Device name	Maximum power consumption	Power output
RSP20-11003Z6TT...		
Supply voltage with characteristic value CC, K9 or KK	15 W	51 Btu (IT)/h
Supply voltage with characteristic value TT	17 W	58 Btu (IT)/h
RSP20-11003Z6ZT...		
Supply voltage with characteristic value CC, K9 or KK	18 W	61 Btu (IT)/h
Supply voltage with characteristic value TT	20 W	68 Btu (IT)/h
RSP25-11003Z6TT...		
Supply voltage with characteristic value CC, K9 or KK	19 W	65 Btu (IT)/h
Supply voltage with characteristic value TT	21 W	72 Btu (IT)/h
RSP25-11003Z6ZT...		
Supply voltage with characteristic value CC, K9 or KK	22 W	75 Btu (IT)/h
Supply voltage with characteristic value TT	24 W	82 Btu (IT)/h
RSP30-08033O6TT...		
Supply voltage with characteristic value CC, K9 or KK	15 W	51 Btu (IT)/h
Supply voltage with characteristic value TT	17 W	58 Btu (IT)/h
RSP30-08033O6ZT...		
Supply voltage with characteristic value CC, K9 or KK	18 W	61 Btu (IT)/h
Supply voltage with characteristic value TT	20 W	68 Btu (IT)/h
RSP35-08033O6TT...		
Supply voltage with characteristic value CC, K9 or KK	19 W	65 Btu (IT)/h
Supply voltage with characteristic value TT	21 W	72 Btu (IT)/h
RSP35-08033O6ZT...		

Device name	Maximum power consumption	Power output
Supply voltage with characteristic value CC, K9 or KK	22 W	75 Btu (IT)/h
Supply voltage with characteristic value TT	24 W	82 Btu (IT)/h

10.4. Signal contact

Signal contact	
Connection type	2-pin terminal block with screw lock
	Tightening torque 0.34 Nm (3 lb-in)
Nominal value	$I_{\max} = 1\text{ A}$ at $U_{\max} = 30\text{ V AC}$ (resistive load) ⁹
	$I_{\max} = 1\text{ A}$ at $U_{\max} = 60\text{ V DC}$ (resistive load) ¹⁰
	$I_{\max} = 1\text{ A}$ at $U_{\max} = 230\text{ V AC}$ (resistive load) ¹¹
	$I_{\max} = 1\text{ A}$ at $U_{\max} = 60\text{ V DC}$ (resistive load) ¹²
	$I_{\max} = 0.2\text{ A}$ at $U_{\max} = 125\text{ V DC}$ (resistive load) ¹³
	$I_{\max} = 0.1\text{ A}$ at $U_{\max} = 250\text{ V DC}$ (resistive load) ¹⁴
	according to the UL Standards:
	$I_{\max} = 1\text{ A}$ at $U_{\max} = 30\text{ V AC}$ (resistive load)
	$I_{\max} = 1\text{ A}$ at $U_{\max} = 30\text{ V DC}$ (resistive load)
	as per ANSI/UL 121201:
	See control drawing in <i>Relevant for use in explosion hazard areas (Hazardous Locations, Class I, Division 2)</i> on page 22.

- 9. Only for device variants featuring supply voltage with characteristic value CC or TT
- 10. Only for device variants featuring supply voltage with characteristic value CC or TT
- 11. Only for device variants featuring supply voltage with characteristic value K9 or KK
- 12. Only for device variants featuring supply voltage with characteristic value K9 or KK
- 13. Only for device variants featuring supply voltage with characteristic value K9 or KK
- 14. Only for device variants featuring supply voltage with characteristic value K9 or KK

10.5. Dimension drawings

10.5.1. Dimension drawings

For more information on the operating temperature characteristic value, see [Device name and product code on page 34](#).

Figure 11. Dimensions of the device variants with operating temperature characteristic value S – Front view

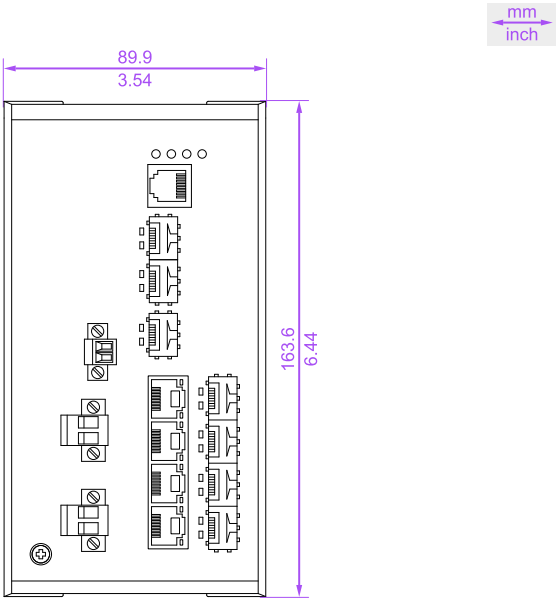


Figure 12. Dimensions of device variants with operating temperature characteristic value S – Side view

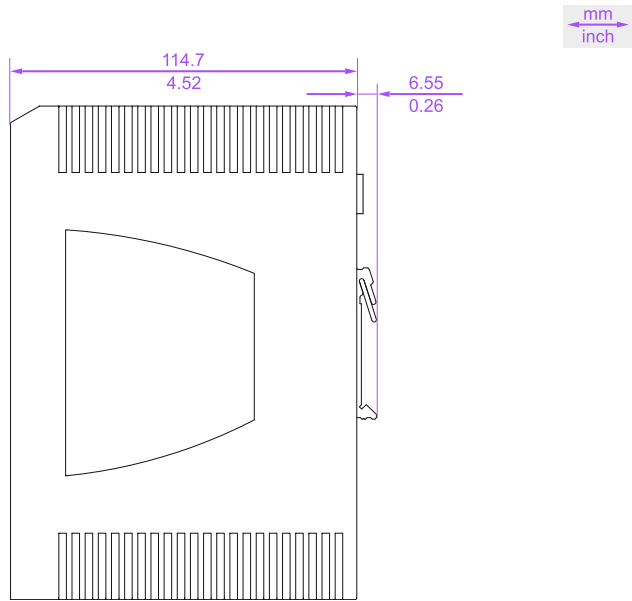


Figure 13. Dimensions of the device variants with operating temperature characteristic value T and E – Front view

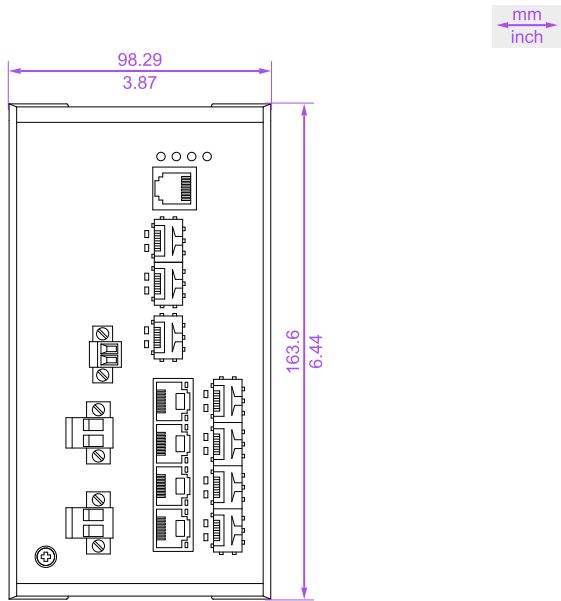


Figure 14. Dimensions of device variants with operating temperature characteristic value T and E – Side view

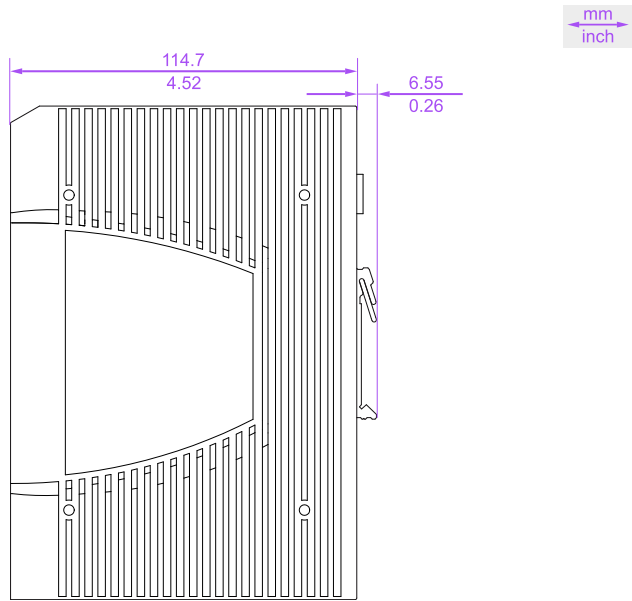
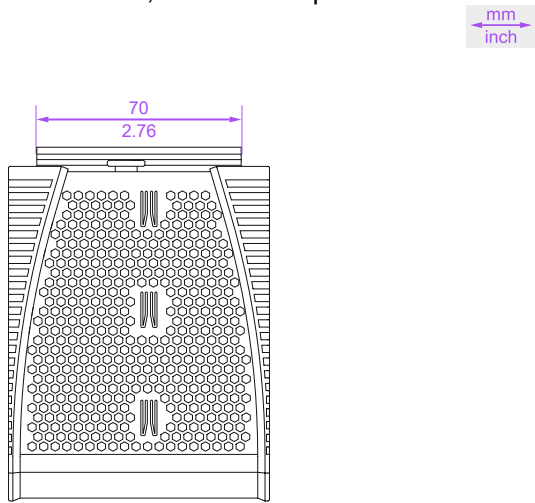


Figure 15. Dimensions of device variants with operating temperature characteristic value S, T and E – Top view



10.6. Climatic conditions during operation

Table 14. Climatic conditions during operation

Minimum clearance around the device	Top and bottom device side: 10 cm (3.94 in) Left and right device side: 2 cm (0.79 in)
Ambient air temperature ¹⁵	Devices with operating temperature characteristic value S (standard): 0 °C ... +60 °C (+32 °F ... +140 °F) ¹⁶ Devices with operating temperature characteristic value T and E (extended): -40 °C ... +70 °C (-40 °F ... +158 °F) ^{17 18} -40 °C ... +85 °C (-40 °F ... +185 °F) for 16 hours (tested in accordance with IEC 60068-2-2) ¹⁹
Maximum inner temperature of device (guideline)	Devices with operating temperature characteristic value S (standard): +86 °C (+186.8 °F) Devices with operating temperature characteristic value T and E (extended): +91 °C (+195.8 °F)
Humidity	5 % ... 95 % (non-condensing)
Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)

15. Temperature of the ambient air at a distance of 5 cm (2 in) from the device
16. Hirschmann recommends to use SFP transceivers with EEC extension.
17. Exclusively use SFP transceivers with extension EEC. If you use SFP transceivers without extension EEC, the standard temperature range applies.
18. When using supply voltage with characteristic value CC, K9 or KK:
– applies when device is equipped with max. 4 SFP transceivers
– if a higher number is connected, the following maximum values apply for the ambient air temperature:
5 transceivers: +68 °C (+154 °F);
6 transceivers: +67 °C (+149 °F);
7 transceivers: +65 °C (+140 °F)
When using supply voltage with characteristic value TT:
– applies when device is equipped with max. 2 SFP transceivers
– if a higher number is connected, the following maximum values apply for the ambient air temperature:
4 transceivers: +65 °C (+140 °F);
5 ... 7 transceivers: +60 °C (+140 °F)
19. When using supply voltage with characteristic value CC, K9 or KK:
– applies when device is equipped with max. 4 SFP transceivers
– if a higher number is connected, the following maximum values apply for the ambient air temperature:
5 ... 7 transceivers: +80 °C (+176 °F)
When using supply voltage with characteristic value TT:
– applies when device is equipped with max. 2 SFP transceivers
– if a higher number is connected, the following maximum values apply for the ambient air temperature:
4 transceivers: +80 °C (+176 °F);
5 ... 7 transceivers: +75 °C (+167 °F)

10.7. Climatic conditions during storage

Table 15. Climatic conditions during storage

Ambient air temperature ²⁰	-40 °C ... +85 °C (-40 °F ... +185 °F)
Humidity	5 % ... 95 % (non-condensing)
Air pressure	min. 700 hPa (+3000 m ASL; +9842 ft ASL) max. 1060 hPa (-400 m ASL; -1312 ft ASL)

10.8. Immunity

Table 16. Immunity: Standard applications

EN 61131-2, CE, FCC – applies to all devices

Applicable standard	Behavior	Frequency
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 3.5 mm (0.14 in) amplitude
IEC 60068-2-6, test Fc	Vibration	8.4 Hz ... 150 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms

Table 17. Immunity: Substation applications

Applicable standard	Behavior	Frequency
IEC 60068-2-6, test Fc	Vibration	2 Hz ... 9 Hz with 3 mm (0.11 in) amplitude
IEC 60068-2-6, test Fc	Vibration	5 Hz ... 8.4 Hz with 3.5 mm (0.14 in) amplitude
IEC 60068-2-6, test Fc	Vibration	9 Hz ... 200 Hz with 1.0 g
IEC 60068-2-6, test Fc	Vibration	200 Hz ... 500 Hz with 1.5 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms

10.9. Electromagnetic compatibility (EMC)

For detailed information on the certificates and declarations applying to your device, see [Table 2 on page 36](#).

20. Temperature of the ambient air at a distance of 5 cm (2 in) from the device

10.9.1. EMC interference emission

Table 18. EMC interference emission: Standard applications

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
Conducted emission		
FCC 47 CFR Part 15		Class A
FCC 47 CFR Part 15	Supply connection	Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled

Table 19. EMC interference emission: Substation applications

Applicable standard		
Radiated emission		
FCC 47 CFR Part 15		Class A
EN 55032		Class A
EN 61000-6-4		Fulfilled
Conducted emission		
FCC 47 CFR Part 15	Supply connection	Class A
EN 55032	Supply connection	Class A
EN 55032	Telecommunication connections	Class A
EN 61000-6-4	Supply connection	Fulfilled
EN 61000-6-4	Telecommunication connections	Fulfilled

10.9.2. EMC interference immunity

Table 20. EMC interference immunity: Standard applications

Applicable standard		
Electrostatic discharge		
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±4 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±8 kV
Electromagnetic field		
EN 61000-4-3	80 MHz ... 3000 MHz	max. 10 V/m
Fast transients (burst)		
EN 61000-4-4 IEEE C37.90.1	Power supply connection	±2 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±4 kV
Voltage surges - DC supply connection		
EN 61000-4-5	line/ground	±2 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - AC supply connection		
EN 61000-4-5	line/ground	±2 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±1 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V

Table 21. EMC interference immunity: Substation applications

Applicable standard		
Electrostatic discharge		
EN 61000-4-2 IEEE C37.90.3	Contact discharge	±8 kV
EN 61000-4-2 IEEE C37.90.3	Air discharge	±15 kV
Electromagnetic field		

Table 21. EMC interference immunity: Substation applications (continued)

Applicable standard		
EN 61000-4-3	80 MHz ... 3000 MHz	max. 10 V/m
IEEE 1613	80 MHz ... 1000 MHz (continuous wave)	max. 35 V/m
Fast transients (burst)		
EN 61000-4-4 IEEE C37.90.1	Power supply connection	±4 kV
EN 61000-4-4 IEEE C37.90.1	Data line	±4 kV
Voltage surges - DC supply connection		
EN 61000-4-5	line/ground	±2 kV
IEEE 1613	line/ground	±5 kV
EN 61000-4-5	line/line	±1 kV
Voltage surges - AC supply connection		
EN 61000-4-5	line/ground	±4 kV
IEEE 1613	line/ground	±5 kV
EN 61000-4-5	line/line	±2 kV
Voltage surges - data line		
EN 61000-4-5	line/ground	±4 kV
Conducted disturbances		
EN 61000-4-6	150 kHz ... 80 MHz	10 V
Damped oscillation – AC/DC supply connection		
EN 61000-4-12 IEEE C37.90.1	line/ground	±2.5 kV
EN 61000-4-12 IEEE C37.90.1	line/line	±1 kV
Damped oscillation – data line		
EN 61000-4-12 IEEE C37.90.1	line/ground	±2.5 kV
EN 61000-4-12	line/line	±1 kV
Pulse Magnetic field		
EN 61000-4-9		300 A/m

10.10. Network range

The cable lengths specified for the transceivers apply for the respective fiber data (fiber attenuation and Bandwidth Length Product BLP/Dispersion).

10.10.1. Twisted-pair port 10/100/1000 Mbit/s

Table 22. Network range: 10/100/1000 Mbit/s twisted-pair port

10/100/1000 Mbit/s twisted-pair port	
Length of a twisted-pair segment	max. 100 m (328 ft) (for Cat5e cable)

10.10.2. Gigabit Ethernet SFP transceiver

Table 23. F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver)

Product code	Mode ²¹	Wave length	Fiber	System attenuation	Example for F/O cable length ²²	Fiber attenuation	BLP ²³ /Dispersion
M-SFP-SX/LC...	MM	850 nm	50/125 µm	0 dB ... 7.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	3.0 dB/km	400 MHz×km
M-SFP-SX/LC...	MM	850 nm	62.5/125 µm	0 dB ... 7.5 dB	0 km ... 0.275 km (0 mi ... 0.17 mi)	3.2 dB/km	200 MHz×km
M-SFP-MX/LC EEC	MM	1310 nm	50/125 µm	0 dB ... 12 dB	0 km ... 1.5 km (0 mi ... 0.93 mi)	1.0 dB/km	800 MHz×km
M-SFP-MX/LC EEC	MM	1310 nm	62.5/125 µm	0 dB ... 12 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.00 dB/km	5000 MHz×km
M-SFP-LX/LC...	MM	1310 nm ²⁴	50/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	800 MHz×km
M-SFP-LX/LC...	MM	1310 nm ²⁵	62.5/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	500 MHz×km
M-SFP-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 km ... 20 km (0 mi ... 12.43 mi) ²⁶	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-LX+/LC...	SM	1310 nm	9/125 µm	5 dB ... 20 dB	14 km ... 42 km (8.70 mi ... 26.10 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-LH/LC...	LH	1550 nm	9/125 µm	5 dB ... 22 dB	23 km ... 80 km (14.29 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	71 km ... 108 km (44.12 mi ... 67.11 mi)	0.25 dB/km	19 ps/(nm×km)

21. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

22. Including 3 dB system reserve when compliance with the fiber data is observed.

23. Using the bandwidth-length product is inappropriate for expansion calculations.

24. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).

25. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).

26. Including 2.5 dB system reserve when compliance with the fiber data is observed.

Table 23. F/O port 1000BASE-FX (SFP fiber optic Gigabit Ethernet Transceiver) (continued)

Product code	Mode ²¹	Wave length	Fiber	System attenuation	Example for F/O cable length ²²	Fiber attenuation	BLP ²³ /Dispersion
M-SFP-LH+/LC	LH	1550 nm	9/125 µm	15 dB ... 30 dB	71 km ... 128 km (44.12 mi ... 79.54 mi)	0.21 dB/km (typical-ly)	19 ps/(nm×km)
M-SFP-LH+/LC EEC	LH	1550 nm	9/125 µm	13 dB ... 32 dB	62 km ... 116 km (38.52 mi ... 72.07 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-LH+/LC EEC	LH	1550 nm	9/125 µm	13 dB ... 32 dB	62 km ... 138 km (38.52 mi ... 85.75 mi)	0.21 dB/km (typical-ly)	19 ps/(nm×km)
SFP-GIG-LX/LC...	MM	1310 nm ²⁷	50/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	800 MHz×km
SFP-GIG-LX/LC...	MM	1310 nm ²⁸	62.5/125 µm	0 dB ... 10.5 dB	0 km ... 0.55 km (0 mi ... 0.34 mi)	1.0 dB/km	500 MHz×km
SFP-GIG-LX/LC...	SM	1310 nm	9/125 µm	0 dB ... 10.5 dB	0 km ... 20 km (0 mi ... 12.43 mi) ²⁹	0.4 dB/km	3.5 ps/(nm×km)

21. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

22. Including 3 dB system reserve when compliance with the fiber data is observed.

23. Using the bandwidth-length product is inappropriate for expansion calculations.

27. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).

28. With F/O adapter compliant with IEEE 802.3-2002 Clause 38 (single-mode fiber offset-launch mode conditioning patch cord).

29. Including 2.5 dB system reserve when compliance with the fiber data is observed.

10.10.3. Fast Ethernet SFP transceiver

Table 24. F/O port 100BASE-FX (SFP Fiber Optic Fast Ethernet Transceiver)

Product code	Mode ³⁰	Wave length	Fiber	System attenuation	Example for F/O cable length ³¹	Fiber attenuation	BLP/Dispersion
M-FAST-SFP-MM/L-C...	MM	1310 nm	50/125 µm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz×km
M-FAST-SFP-MM/L-C...	MM	1310 nm	62.5/125 µm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km
M-FAST-SFP-SM/L-C...	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-SM+LC...	SM	1310 nm	9/125 µm	10 dB ... 29 dB	25 km ... 65 km (15.53 mi ... 40.39 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-FAST-SFP-LH/L-C...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	47 km ... 104 km (29.20 mi ... 64.62 mi)	0.25 dB/km	19 ps/(nm×km)
M-FAST-SFP-LH/L-C...	SM	1550 nm	9/125 µm	10 dB ... 29 dB	55 km ... 140 km (14.29 mi ... 86.99 mi)	0.18 dB/km ³²	18 ps/(nm×km)
SFP-FAST-MM/LC ³³	MM	1310 nm	50/125 µm	0 dB ... 8 dB	0 km ... 5 km (0 mi ... 3.11 mi)	1.0 dB/km	800 MHz
SFP-FAST-MM/L-C EEC ³⁴	MM	1310 nm	62.5/125 µm	0 dB ... 11 dB	0 km ... 4 km (0 mi ... 2.49 mi)	1.0 dB/km	500 MHz×km

30. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

31. Including 3 dB system reserve when compliance with the fiber data is observed.

32. With ultra-low-loss optical fiber.

33. You will find further information on certifications at [catalog.belden.com](https://www.belden.com/catalog).

34. You will find further information on certifications at [catalog.belden.com](https://www.belden.com/catalog).

Table 24. F/O port 100BASE-FX (SFP Fiber Optic Fast Ethernet Transceiver) (continued)

Product code	Mode ³⁰	Wave length	Fiber	System attenuation	Example for F/O cable length ³¹	Fiber attenuation	BLP/Dispersion
SFP-FAST-SM/LC ³⁵	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-SM/L- C EEC ³⁶	SM	1310 nm	9/125 µm	0 dB ... 13 dB	0 km ... 25 km (0 mi ... 15.53 mi)	0.4 dB/km	3.5 ps/(nm×km)

10.10.4. Bidirectional Fast Ethernet SFP transceiver

Table 25. F/O port (bidirectional Fast Ethernet SFP transceiver)

Product code SFP-FAST-B...	Mode ³⁷	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O ca- ble length ³⁸	Fiber attenuation	Dispersion
SFP-FAST-BA MM/LC EEC	MM	1310 nm	1550 nm	50/125 µm 62.5/125 µm	0 dB ... 16 dB	0 km ... 2 km (0 mi ... 1.24 mi)	1.0 dB/km	800 MHz×km 500 MHz×km
SFP-FAST-BB MM/LC EEC	MM	1550 nm	1310 nm	50/125 µm 62.5/125 µm	0 dB ... 16 dB	0 km ... 2 km (0 mi ... 1.24 mi)	1.0 dB/km	800 MHz×km 500 MHz×km
SFP-FAST-BA SM/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 18 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)

30. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

31. Including 3 dB system reserve when compliance with the fiber data is observed.

35. You will find further information on certifications at [catalog.belden.com](https://www.belden.com/catalog).

36. You will find further information on certifications at [catalog.belden.com](https://www.belden.com/catalog).

37. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

38. Including 3 dB system reserve when compliance with the fiber data is observed.

Table 25. F/O port (bidirectional Fast Ethernet SFP transceiver) (continued)

Product code SFP-FAST-B...	Mode ³⁷	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length ³⁸	Fiber attenuation	Dispersion
SFP-FAST-BB SM/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 18 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-FAST-BA SM +LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 29 dB	0 km ... 60 km (0 mi ... 37.29 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-FAST-BB SM +LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 29 dB	0 km ... 60 km (0 mi ... 37.29 mi)	0.25 dB/km	19 ps/(nm×km)

10.10.5. Bidirectional Gigabit Ethernet SFP transceiver

Table 26. F/O port (bidirectional Gigabit Ethernet SFP transceiver)

Product code	Mode ³⁹	Wave length TX	Wave length RX	Fiber	System attenua- tion	Example for F/O cable length ⁴⁰	Fiber attenu- ation	BLP/Dispersion
M-SFP-BIDI Type A LX/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 11 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
M-SFP-BIDI Type B LX/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 11 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.25 dB/km	19 ps/(nm×km)
M-SFP-BIDI Type A LH/LC EEC	LH	1490 nm	1590 nm	9/125 µm	5 dB ... 24 dB	23 km ... 80 km (14.29 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)

37. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

38. Including 3 dB system reserve when compliance with the fiber data is observed.

39. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

40. Including 3 dB system reserve when compliance with the fiber data is observed.

Table 26. F/O port (bidirectional Gigabit Ethernet SFP transceiver) (continued)

Product code	Mode ³⁹	Wave length TX	Wave length RX	Fiber	System attenuation	Example for F/O cable length ⁴⁰	Fiber attenuation	BLP/Dispersion
M-SFP-BIDI Type B LH/LC EEC	LH	1590 nm	1490 nm	9/125 µm	5 dB ... 24 dB	23 km ... 80 km (14.29 mi ... 49.71 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LX/LC EEC	SM	1310 nm	1550 nm	9/125 µm	0 dB ... 15 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX/LC EEC	SM	1550 nm	1310 nm	9/125 µm	0 dB ... 15 dB	0 km ... 20 km (0 mi ... 12.43 mi)	0.25 dB/km	19 ps/(nm×km)
SFP-GIG-BA LX+/LC EEC	SM	1310 nm	1550 nm	9/125 µm	3 dB ... 20 dB	12 km ... 40 km (7.45 mi ... 24.86 mi)	0.4 dB/km	3.5 ps/(nm×km)
SFP-GIG-BB LX+/LC EEC	SM	1550 nm	1310 nm	9/125 µm	3 dB ... 20 dB	12 km ... 40 km (7.45 mi ... 24.86 mi)	0.25 dB/km	19 ps/(nm×km)

39. MM = Multimode, SM = Singlemode, LH = Singlemode Longhaul

40. Including 3 dB system reserve when compliance with the fiber data is observed.

11. Scope of delivery

Table 27. Scope of delivery

Amount	Article
1 ×	Device
1 ×	Safety and general information sheet
1 ×	Information sheet for use in explosive atmospheres (depending on device variant)
1 ×	2-pin terminal block for signal contact
1 ×	3-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value K9)
2 ×	3-pin terminal block for the supply voltage (exclusively for device variants featuring supply voltage with characteristic value KK)
2 ×	2-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value CC)
2 ×	2-pin terminal block for the supply voltage (only for device variants featuring supply voltage with characteristic value TT)

12. Order numbers

12.1. Accessories

You find more information on available accessories in the Belden Online Catalog at catalog.belden.com.

Note that products recommended as accessories may have different characteristics to those of the device, which may limit the application range of the overall system. For example, if you add an accessory with IP20 to a device with IP65, the degree of protection of the overall system is reduced to IP20.

Table 28. General accessories

Article	Order number
2-pin terminal block for signal contact (50 pieces)	943845010
3-pin terminal block for supply voltage (50 pieces) ⁴¹	943845008
2-pin terminal block for supply voltage (50 pieces) ⁴²	943845009
AutoConfiguration Adapter ACA31	942074001
Network management software Industrial HiVision	943156xxx
Terminal cable	943301001
Power Cord	942000001
Protection cap for RJ45 socket (50 pieces)	943936001
Protection cap for SFP slot (25 pieces)	943942001

12.1.1. Fast Ethernet SFP transceiver

Fast Ethernet SFP transceiver	Order number
M-FAST SFP-TX/RJ45	942098001
M-FAST SFP-TX/RJ45 EEC	942098002

The following operating conditions apply to twisted pair transceivers:

41. Only for device variants featuring supply voltage with characteristic value K9 or KK
42. Only for device variants featuring supply voltage with characteristic value CC or TT

Fast Ethernet SFP transceiver	Order number
• Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly. • Not applicable for combo ports. • Not applicable for ports which support only Gigabit Ethernet. • It is currently not possible to set autocrossing manually.	
M-FAST SFP-MM/LC	943865001
M-FAST SFP-MM/LC EEC	943945001
M-FAST SFP-SM/LC	943866001
M-FAST SFP-SM/LC EEC	943946001
M-FAST SFP-SM+/LC	943867001
M-FAST SFP-SM+/LC EEC	943947001
M-FAST SFP-LH/LC	943868001
M-FAST SFP-LH/LC EEC	943948001
SFP-FAST-MM/LC ⁴³	942194001
SFP-FAST-MM/LC EEC ⁴⁴	942194002
SFP-FAST-SM/LC ⁴⁵	942195001
SFP-FAST-SM/LC EEC ⁴⁶	942195002

12.1.2. Gigabit Ethernet SFP transceiver

Gigabit Ethernet SFP transceiver	Order number
M-SFP-TX/RJ45	943977001
M-SFP-TX/RJ45 EEC	942161001

The following operating conditions apply to twisted pair transceivers:

- Longer RSTP switching times and link loss detection times compared to twisted pair ports provided by the device directly.
- Not applicable for combo and Fast Ethernet ports.
- Exclusively supports the autonegotiation mode including autocrossing.

M-SFP-SX/LC	943014001
M-SFP-SX/LC EEC	943896001

43. You will find further information on certifications at catalog.belden.com.

44. You will find further information on certifications at catalog.belden.com.

45. You will find further information on certifications at catalog.belden.com.

46. You will find further information on certifications at catalog.belden.com.

Gigabit Ethernet SFP transceiver	Order number
M-SFP-MX/LC EEC	942108001
M-SFP-LX/LC	943015001
M-SFP-LX/LC EEC	943897001
M-SFP-LX+/LC	942023001
M-SFP-LX+/ LC EEC	942024001
M-SFP-LH/LC	943042001
M-SFP-LH/LC EEC	943898001
M-SFP-LH+/LC	943049001
M-SFP-LH+/LC EEC	943119001
SFP-GIG-LX/LC ⁴⁷	942196001
SFP-GIG-LX/LC EEC ⁴⁸	942196002

12.1.3. Bidirectional Fast Ethernet SFP transceiver

Table 29. Accessory: Bidirectional Fast Ethernet SFP transceiver

Bidirectional Fast Ethernet SFP transceiver	Certification type ⁴⁹	Order number
SFP-FAST-BA MM/LC EEC ⁵⁰	Entry level	942204001
SFP-FAST-BB MM/LC EEC ⁵¹	Entry level	942204002
SFP-FAST-BA SM/LC EEC ⁵²	Entry level	942205001
SFP-FAST-BB SM/LC EEC ⁵³	Entry level	942205002
SFP-FAST-BA SM+/LC EEC ⁵⁴	Entry level	942206001
SFP-FAST-BB SM+/LC EEC ⁵⁵	Entry level	942206002

- 47. You will find further information on certifications at catalog.belden.com.
- 48. You will find further information on certifications at catalog.belden.com.
- 49. Use Entry level SFP transceivers for industrial applications that exclusively require the following approvals: CE, FCC or UL 61010-2-20.
- 50. You will find further information on certifications at catalog.belden.com.
- 51. You will find further information on certifications at catalog.belden.com.
- 52. You will find further information on certifications at catalog.belden.com.
- 53. You will find further information on certifications at catalog.belden.com.
- 54. You will find further information on certifications at catalog.belden.com.
- 55. You will find further information on certifications at catalog.belden.com.

12.1.4. Bidirectional Gigabit Ethernet SFP transceiver

Table 30. Accessory: Bidirectional Gigabit Ethernet SFP transceiver

Bidirectional Gigabit Ethernet SFP transceiver	Order number
M-SFP-BIDI Type A LX/LC EEC	943974001
M-SFP-BIDI Type B LX/LC EEC	943974002
M-SFP-BIDI Type A LH/LC EEC	943975001
M-SFP-BIDI Type B LH/LC EEC	943975002
M-SFP-BIDI Bundle LX/LC EEC (Type A + B)	943974101
M-SFP-BIDI Bundle LH/LC EEC (Type A + B)	943975101
SFP-GIG-BA LX/LC EEC ⁵⁶	942207001
SFP-GIG-BB LX/LC EEC ⁵⁷	942207002
SFP-GIG-BA LX+/LC EEC ⁵⁸	942208001
SFP-GIG-BB LX+/LC EEC ⁵⁹	942208002

56. You will find further information on certifications at catalog.belden.com.

57. You will find further information on certifications at catalog.belden.com.

58. You will find further information on certifications at catalog.belden.com.

59. You will find further information on certifications at catalog.belden.com.

13. Underlying technical standards

The device has an approval based on a specific standard exclusively if the approval indicator appears on the device casing.

The device generally fulfills the technical standards named in their current versions.

Table 31. List of technical standards

ANSI/UL 121201	Nonincendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
CSA C22.2 No. 142	Canadian National Standard(s) – Process Control Equipment – Industrial Products
DNV-CG-0339	Environmental test specification for electrical, electronic and programmable equipment and systems.
EN 55032	Electromagnetic compatibility of multimedia equipment – Emission Requirements
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
EN 62368-1	Information technology equipment – Safety – Part 1: General requirements
FCC 47 CFR Part 15	Code of Federal Regulations
IEC/EN 60079-0	Explosive atmospheres – Part 0: Equipment – General requirements
IEC/EN 60079-7	Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
IEC/EN 60079-15	Explosive atmospheres – Part 15: Equipment protection by type of protection "n"
IEC/EN 61850-3	Communication networks and systems for power utility automation - Part 3: General requirements.
IEEE 802.1AB	Station and Media Access Control Connectivity Discovery
IEEE 802.1D	Media Access Control Bridges
IEEE 802.1Q	Virtual LANs (VLANs, MRP, Spanning Tree)
IEEE 802.3	Ethernet
IEEE 1613	IEEE Standard Environmental and Testing Requirements for Communication Networking Devices in Electric Power Substations
NEMA TS 2	Traffic Controller Assemblies with NTCIP Requirements (environmental requirements)
UL 508	Safety for Industrial Control Equipment

Further support

Technical questions

For technical questions, please contact any Belden dealer in your area or Belden directly.

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The current manuals and operating instructions for Belden products are available at doc.hirschmann.com.

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